



OCT 24 2012

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October 16, 2012

Wendy Cheung  
US EPA  
Mailcode: 8P-W-GW  
1595 Wynkoop Street  
Denver, CO 80202

RE: Falloff Test Proposed Procedure--Well DI-1 (EPA UIC Permit no. CO12143-08425)

Dear Wendy:

As required, East Cherry Creek Water and Sanitation District (ECCV) will be performing the first annual falloff Test on it's DI-1 injection well in a few months. We would like to outline the procedure we would like to follow for this and future annual falloff tests. To the extent possible, we are following the EPA document "EPA Region 6, UIC Pressure Falloff Testing Guideline, Third Revision" (August 8, 2002).

Because there is wire and two transducers in the bottom of this well from a previous step rate test, we request a variance from the regulation to tag the bottom of the well. Tagging the bottom of the well could result in entangling the tagging tool and reduction in injection capacity.

Please review the attached Falloff Test Procedure for ECCV Well DI-1 and provide the ECCV with written approval of the attached scope of work as soon as possible.

Sincerely,

A handwritten signature in blue ink, appearing to read "Chris Douglass", is written over a horizontal line.

Chris Douglass, P.E.  
Project Supervisor

cc: Pat O'Brien, Hydrokinetics Inc.  
Rick Clark, ECCV

J:\UTILITIES 2012\Northern Project\deep well injection\Falloff Test procedure DI1 20121022.rtf



ECCV promotes public health by providing clean, safe, reliable drinking water and dependable sanitary sewer services.  
*"Customer focused, regionally involved"*

## **FALLOFF TEST PROCEDURE FOR ECCV WELL DI-1**

### **INJECTION AND FALLOFF PERIOD**

ECCV has been injecting fluids into well DI-1 for several months. Based on flow rate and time vs pressure data obtained to date, it appears that a valid falloff test can be performed by injecting at a constant rate for 48 hours and recording falloff data for about 90 hours after injection stops. Therefore, we intend to test the well by injecting at 100 to 350 gpm for 48 hours and recording falloff pressure data for about 90 to 100 hours. Our data shows that the well (at the wellhead) should be able to maintain a positive pressure during this time period.

### **MONITORING**

We will monitor wellhead pressure and temperature with one transducer inside the wellhead at 1 to 3 feet above ground level. Measurements for both will be taken at one minute intervals. The transducer will be calibrated prior to testing. A copy of the manufacturer's recommended calibration frequency as well as the certificate of calibration will be provided with the test report. We anticipate the transducer range will be 0 to 2000 psi and temperature will range from 32 to 180 degrees Fahrenheit. We will not use the mechanical pressure gauge currently in place because it is not able to provide the precise data required

Flow rate will be measured every minute with the existing flow meter near the injection pump. The range of flow meter is from 0 to 1000 gpm.

The viscosity of the injectate will be measured in cP, using API method 13-B2, and recorded three times during the 48 hour period of injection just prior to the falloff test. We anticipate measuring viscosity at the beginning, end and near the middle of the pumping period mentioned above.

## **UIC PRESSURE FALLOFF TESTING REPORT RESULTS FOR ECCV WELL DI-1.**

\*The first falloff test will be conducted between January 24, 2013 and July 24, 2013. Subsequent falloff tests will be conducted annually using the same dates listed above.

\*The falloff test report will be submitted to the EPA within 60 days of completion of the test.

\*The report will include, at a minimum:

1. Company name and address.
2. Test well name and location.
3. Name and phone number of the facility contact person and contractor
4. A copy of the SP and gamma log through the injection zones showing the type of formations and thickness of the injection interval.
5. Well schematic showing wellbore configuration including wellbore radius, completed intervals, and type of completion.
6. Depth of fill and date tagged will not be obtained due to debris in well.
7. Offset well information will not be obtained as there are no offset wells.
8. Chronological listing of daily testing activities.
9. Electronic submission of raw time, pressure, and temperature data from all gauges and transmitters used during testing. A summary explaining all data will be submitted with the raw data. Any edited data will be submitted separately.
10. Tabular summary of the injection rate or rates preceding the falloff test for 48 hours prior to testing or for a time equal to twice the time of the falloff test, whichever is greater.
11. Flow rate from offset well is not applicable as there are no offset wells present.
12. Hard copy of the time vs pressure data analyzed.
13. Pressure Gauge Information
  - List of all gauges used to test the well.
  - Depth of each gauge.
  - Manufacturer, type and range of gauges.
  - Resolution and accuracy of gauges as a percentage of full range.
  - Calibration certificate and manufacturer's recommended frequency of calibration.

14. General Test Information

Date of Test

Time synchronization: A specific time and date will be synchronized to an equivalent time in each pressure file submitted.

Location of the shut-in valve relative to wellhead.

15. Reservoir Parameters

Formation fluid viscosity

Porosity

Total compressibility

Formation volume factor

Initial formation reservoir pressure

Date reservoir pressure was last stabilized (injection history)

Justified interval thickness

16. Waste Plume

Cumulative injection volume.

Calculated radial distance to the waste front.

Average historical waste fluid viscosity if used in analysis.

17. Injection period

Time of injection period.

Type of test fluid.

Type of pump used for test.

Type of rate meter used for test.

18. Falloff Period

Total shut-in time, real time and elapsed time.

Final shut-in pressure and temperature

Time well went on vacuum, if applicable

19. Pressure Gradient

Gradient stops for depth correction

20. Calculated Test Data

Radius of investigation

Slope or slopes from semilog plot

Transmissivity

Permeability

Skin factor

Skin pressure drop

Discussion and justification of any reservoir or outer boundary models used to simulate test.

Explanation of any pressure or temperature anomaly, if observed

21. Graphs

Cartesian plot of pressure and temperature vs. time

Log-log diagnostic plot: pressure and semilog derivative curves. Radial flow regime will be identified on plot.

Semilog and expanded semilog plots: radial flow regime indicated and the semilog straight line drawn.

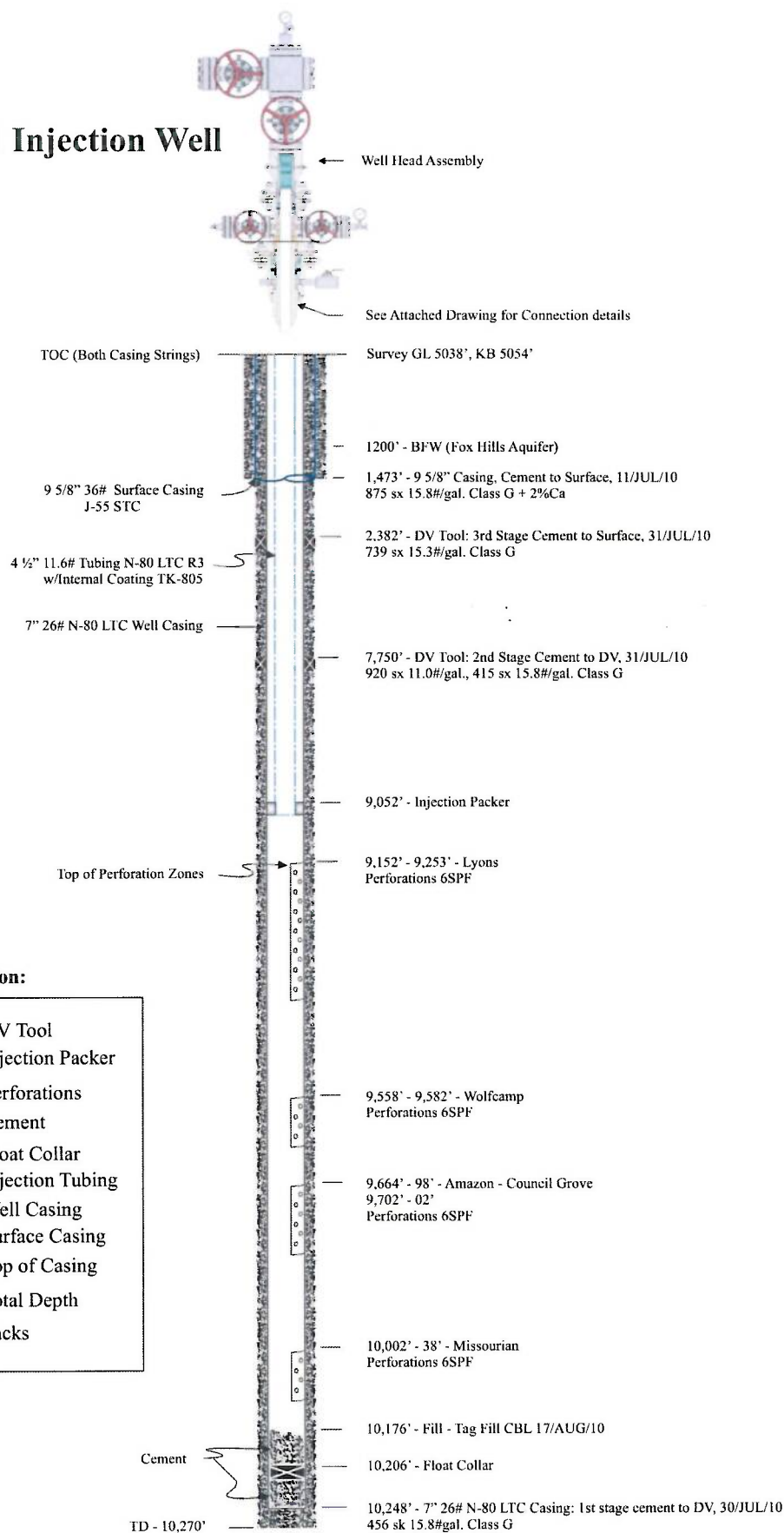
Injection rate(s) vs. time.

22. A comparison of all parameters with those used in the petition demonstrating where the parameters can be found in the petition.

23. Not applicable, no radioactive tracers have been run on the well.

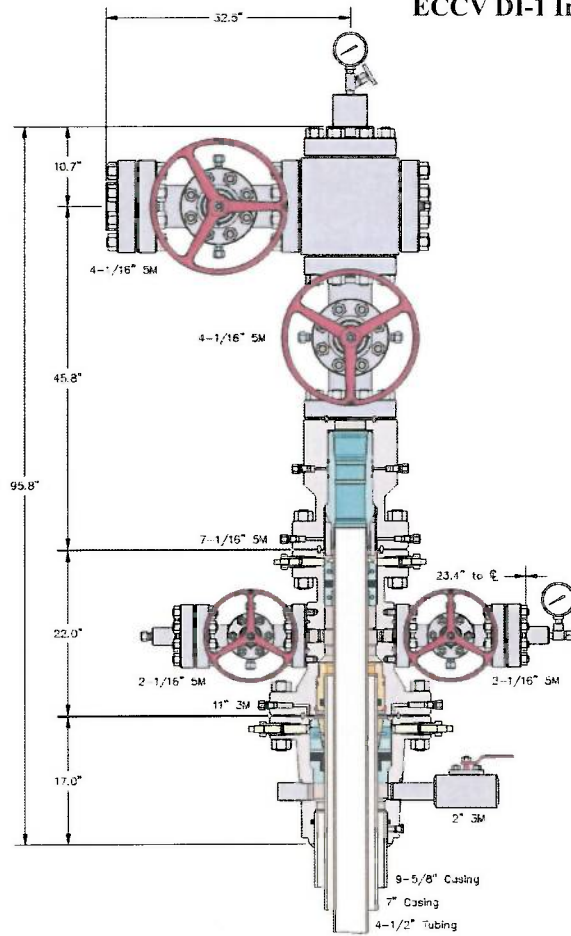
24. Compliance with any unusual petition approval conditions.

# ECCV DI-1 Injection Well



Hydro Resources - Rocky Mountain, Inc.	Client: East Cherry Creek Valley WSD	View: Elevation Drawing (As Built)
Job #RKYR00652	Project: ECCV DI-1 Injection Well	Description: Page <u>1</u> of <u>1</u>
Date: 10/21/10	Drawing By: Randy Parsons	<b>Not to Scale</b>

# ECCV DI-1 Injection Well



**"As Built"**

This drawing is the property of Wood Group Pressure Control and is considered confidential. Unless otherwise approved in writing, neither it nor its contents may be used, copied, transmitted or reproduced except for the sole purpose of Wood Group Pressure Control.

WOOD GROUP PRESSURE CONTROL

Hydro Resources  
ECCV DI-1 Injection Well

9-5/8" x 7" x 4-1/2" 5M Conventional  
Wellhead Assembly, With T-EBS Tubing Head, T-2W  
Tubing Hanger, O10 Coupling and Adapter Flange

DRAWN	BJS	29JUN10
APPROV	VJK	29JUN10
DRAWING NO.	AE18771-A	